MANAGEMENT OF THE MONTANA DEFERRED MAINTENANCE BACKLOG

A Report Prepared for the

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Montana has developed a significant deferred maintenance backlog. The backlog is the product of a decade or more of insufficient major maintenance and repair funding in the Long-Range Building "Cash" Program (LRBP). Without a funding management plan for the deferred maintenance backlog, the cost of correcting the deficiencies will increase. Preliminary numbers, developed by the Architecture and Engineering Division (A&E) of the Department of Administration (DOA), show the measurable value of the current backlog at approximately $142 million, which can then be extrapolated to $205 million to account for significant underreporting of projects in future biennia by other non-University agencies. In this report, staff will present the findings of the amortization of the estimated deferred maintenance backlog over a period of 10 and 20 years.

Deferred maintenance is defined as necessary maintenance that has been postponed. Literature relating to the maintenance of public buildings recommends funding building maintenance at two to four percent of the building's replacement value annually (includes "normal" maintenance). According to the Building Research Board in a 1990 publication, "… if a backlog exists, it is unlikely to be reduced by expenditure limited to the 2 to 4 percent level. Further deterioration will occur if the backlog is not reduced, and the ultimate cost of correcting the deficiencies will increase."[1] Consequently, a greater level of funding is needed for a period of time to bring buildings back to total repair and alleviate the building stresses caused by the backlog.

Preliminary estimates, developed by A&E, show the measurable value of the current backlog at approximately $142.0 million. This accounting of the current backlog is developed from projects requested by agencies that to date have not been funded and projected deferred maintenance requests from the Montana University System (MUS). However, this list of unfunded requests was developed during a period when Montana experienced budget wide funding shortfalls resulting from the effects of the 9-11 terrorist threats and resulting recession. Because of agency awareness for the lack of available of repair and maintenance funding, fewer project requests were presented to A&E for inclusion in the LRBP. In fact, requests from non-University state agencies make up only $5.1 million, or about .4 percent, of the total unfunded requests listed. Using the fact that MUS has ownership of 65 percent of the total building inventory eligible for the LRBP, a conservative estimate of other state agency backlogs can be extrapolated. Consequently, the deferred maintenance backlog is estimated at nearly $205.2 million when extrapolated to include the state agency deferred projects.

One method of managing the estimated $205.2 million backlog is to spread the deferred maintenance work over time, for example 10 or 20 years. While the ideal situation would be to eliminate the backlog in its entirety and immediately, there are limits in the capacity of state funds available for building maintenance. There are two considerations for managing the backlog over a 10 or 20-year period. First, while waiting to be started the maintenance problems could worsen. To avoid a catastrophic failure, A&E would need to carefully prioritize projects based on the severity of the problem. Historically, A&E has prioritized projects for the LRBP, so this is a process well understood by the division. Second, building/repair costs will increase as the costs of building materials increase. The Bureau of Economic Analysis (BEA) has recently developed new price indexes for non-residential buildings. The indexes, developed in 2003, provide only 1 year of data at this time. However, in the BEA research related to development of the indexes, a number of hedonic regression models were created, one that presents an average for warehouse cost inflation and one that presents an average of office building cost inflation. Both models showed significance in the statistics that measure adequacy. The average growth rate of warehouse costs was 3.9 percent, and the average growth rate of office costs was 3.92 percent. A cost inflation rate of 3.91 percent was used in developing an amortization to managing the deferred maintenance backlog over a 10 or 20-year period. The results of amortizing the backlog over 10 and 20 years are seen in the tables on the next page.

[1]The National Academy of Sciences, Natural Research Counsel. "Committing to the Cost of Ownership: Maintenance and Repair of Public Buildings". 1990. pp. 19).

10 Year Deferred Maintenance Amortization

In Millions

Inputs		Key Figures	
Principal Amount	$205.160	Annual Payments	$24.84
Annual Inflaition Rate	3.91%	Sum of All Payments	$248.40
Period in Years	10		
Base Year	2008		

Yearly Schedule of Balances and Payments (millions)

Year	Balance	Payments	Principal	Inflation Cost	Cumulative Principal	Cumulative Inflation Cost	Ending Balance
2008	$205.160	$24.840	$17.120	$7.720	$17.120	$7.720	$188.040
2009	188.040	24.840	17.640	7.200	34.760	14.920	170.410
2010	170.410	24.840	18.510	6.330	53.270	21.250	151.900
2011	151.900	24.840	19.240	5.600	72.510	26.850	132.660
2012	132.660	24.840	20.010	4.830	92.520	31.680	112.650
2013	112.650	24.840	20.810	4.030	113.320	35.720	91.840
2014	91.840	24.840	21.630	3.210	134.960	38.920	70.210
2015	70.210	24.840	22.500	2.340	157.450	41.270	47.710
2016	47.710	24.840	23.390	1.450	180.840	42.720	24.320
2017	24.320	24.840	24.320	0.520	205.160	43.240	0.000

A ten year amortization will require funding of $24.8 million each year. In each biennium the cost will be $49.7 million.

20 Year Deferred Maintenance Amortization

In Millions

Inputs		Key Figures	
Principal Amount	$205.160	Annual Payments	$14.760
Annual Inflaition Rate	3.91%	Sum of All Payments	$295.200
Period in Years	20		
Base Year	2008		

Yearly Schedule of Balances and Payments (millions)

Year	Balance	Payments	Principal	Inflation Cost	Cumulative Principal	Cumulative Inflation Cost	Ending Balance
2008	$205.160	$14.760	$6.860	$7.900	$6.860	$7.900	$198.300
2009	198.300	14.760	7.770	6.990	14.630	14.890	190.530
2010	190.530	14.760	7.440	7.320	22.070	22.210	183.090
2011	183.090	14.760	7.740	7.020	29.810	29.230	175.350
2012	175.350	14.760	8.050	6.710	37.860	35.940	167.300
2013	167.300	14.760	8.370	6.390	46.220	42.340	158.940
2014	158.940	14.760	8.700	6.060	54.920	48.400	150.240
2015	150.240	14.760	9.050	5.710	63.970	54.110	141.190
2016	141.190	14.760	9.410	5.350	73.380	59.460	131.780
2017	131.780	14.760	9.780	4.980	83.160	64.440	122.000
2018	122.000	14.760	10.170	4.590	93.330	69.030	111.830
2019	111.830	14.760	10.580	4.180	103.900	73.220	101.260
2020	101.260	14.760	11.000	3.760	114.900	76.980	90.260
2021	90.260	14.760	11.430	3.330	126.340	80.300	78.820
2022	78.820	14.760	11.890	2.870	138.220	83.180	66.940
2023	66.940	14.760	12.360	2.400	150.590	85.570	54.570
2024	54.570	14.760	12.850	1.910	163.440	87.480	41.720
2025	41.720	14.760	13.370	1.390	176.810	88.870	28.350
2026	28.350	14.760	13.900	0.860	190.710	89.730	14.450
2027	14.450	14.760	14.450	0.310	205.160	90.040	0.000

A 20 year amortization will require an annual commitment of $14.8 million, or $29.5 million each biennium.

The deferred maintenance backlog can be spread across the LRBP eligible agencies by square foot of the space they occupy. In the most recent building inventory provided by the Montana Risk Management and Tort Defense Division (2005), LRBP eligible buildings have 9,860,256 square feet of space (the figures are developed from buildings with a replacement value of $100,000 or more). The figure below shows square feet and percentage of square feet occupied by agency.

Square Feet of Building Space by Agency

Agency	Square Feet	Percent
Department of Agriculture	7,888	0.08%
Board of Education	163,405	1.66%
Department of Corrections	885,622	8.98%
Department of Administration	1,339,409	13.58%
Department of Natural Resources and Conservation	103,579	1.05%
Department of Revenue	91,781	0.93%
Department of Public Health and Human Services	852,798	8.65%
Justice Department	88,843	0.90%
Department of Military Affairs	509,238	5.16%
Montana University System, MSU	3,130,761	31.75%
Montana University System, UM	2,686,932	27.25%
Total	9,860,256	100.00%

The total cost of amortizing the estimated deferred maintenance backlog over a ten-year period is $2.52 per square foot ($24.84 million / 9,860,256). The total cost amortized over 20 years is $1.50 per square foot ($14.76 million / 9,860,256). The following figure shows the cost of each of the plans to the agencies.

Amortized Annual Deferred Maintenance Cost by Square Feet by Agency

Agency	Square Feet	Percent	10 Year (millions)	20 Year (millions)
Amortized Annual Deferred Maintenance Cost			$24.840	$14.760
Department of Agriculture	7,888	0.08%	0.020	0.012
Board of Education	163,405	1.66%	0.412	0.245
Department of Corrections	885,622	8.98%	2.231	1.326
Department of Administration	1,339,409	13.58%	3.374	2.005
Department of Natural Resources and Conservation	103,579	1.05%	0.261	0.155
Department of Revenue	91,781	0.93%	0.231	0.137
Department of Public Health and Human Services	852,798	8.65%	2.148	1.277
Justice Department	88,843	0.90%	0.224	0.133
Department of Military Affairs	509,238	5.16%	1.283	0.762
Montana University System, MSU	3,130,761	31.75%	7.887	4.686
Montana University System, UM	2,686,932	27.25%	6.769	4.022
Total	9,860,256	100.00%	$24.840	$14.760

Note that the amounts included in the table above are the annual costs by agency, based on the agency's square feet of occupied space. To determine the cost per agency for each biennium, the amounts must be doubled.

One concern in regards to this analysis is to what degree fully funding the elimination of the deferred maintenance backlog is required. If the LRBP is fully funded, some of the projects included in the deferred maintenance backlog might find funding through the LRBP, although it is very difficult to project how much of the backlog could be eliminated this way. Maintenance experts recommend developing a system to track the progress of eliminating the backlog. Such a system might also allow A&E to stay abreast of the future maintenance needs. While the specifics of such a maintenance administrative system are beyond the scope of this analysis, discussion of the development of such a system is warranted.

The deferred maintenance backlog is estimated at $205.2 million. The backlog has accumulated over a number of years. Experts in the field of building maintenance recommend funding total the maintenance of state buildings at 2 to 4 percent of the building's replacement value. Furthermore, when a backlog of deferred maintenance exists, funding should be increased to eliminate the deficiencies. For the estimated backlog in Montana, full maintenance funding would need to increase by $24.8 million per year over 10 years or $14.8 million per year over 20 years. While questions exist regarding the amount of the current deferred maintenance backlog that could be eliminated strictly through adequate funding of the LRBP, there is no question that some additional funding for the backlog would insure that maintenance problems in state buildings are reduced.

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